

fishes discovered by Mr. Salwey in the Old Red Sandstone of Acton Beauchamp, and others by Mr. Lightbody in the upper bone-beds near Ludlow. From the first-named locality the author described a portion of a cephalic carapace, indicating a large and new species of *Cephalaspis* (*C. Salweyi*). Another new species of *Cephalaspis* (*C. Murchisoni*) was founded on two specimens obtained by Mr. Lightbody in a bed below the paper-mill on the river Teme at Ludlow; and a third new species (*C. ornatus*) was described from specimens from dark micaceous shales in the Hereford Railway Cutting at Ludlow. The same shales have afforded two specimens of a very small Cephalaspid of great interest. These are of the size of a four-penny piece, and have a general resemblance to *Cephalaspis*, except in the peculiarity of having behind the cephalic shield, and united to its posterior margin by a distinctly marked suture, a broad plate divided into lateral halves by a prolongation of the occipital crest. The author, having stated his reasons for regarding these specimens as adult and not embryonic individuals, gave this new Cephalaspid form the generic title *Auchenaspis* (on account of its *nuchal* plate), and described it under the specific name of *A. Salteri*. In conclusion, some other ichthyic remains, referable to *Plectrodus* and *Onchus*, were enumerated as having been collected by Mr. Lightbody in the railway-cutting and in the River-bed near Ludlow.

MISCELLANEOUS.

Observations on the Generation of the Arachnida.

By E. BLANCHARD.

SINCE Bonnet's experiments on the *Aphides*, naturalists have frequently paid attention to the faculty attributed to the females of certain articulated animals, of engendering without the aid of any male. Thus it has been asserted that some female spiders, kept in captivity and isolated, frequently deposited fertile eggs, and that these broods might succeed one another for several years. From this observation it appeared natural to conclude that in this case the males were not always of indispensable utility in the continuation of the species. In connexion with this, one of the results of my investigations into the anatomy and physiology of these animals appears to me to be worth recording.

It is very true that female spiders, when isolated in boxes, furnish eggs which are soon hatched, and this after a captivity of three or four years. Specimens of *Mygale* sent from Montpellier to Paris, and each contained in a separate box, have repeatedly furnished me with a great number of young ones. A *Segestria* (*S. perfida*, Walck.) which I have kept alive for more than three years, produced young the year before last, and again last year; hardly a month ago hundreds of the young were still living. Another form of the order *Araneida*, a *Filistata bicolor*, which has also lived for three years in my laboratory, constructed its nest some months ago, and soon afterwards gave birth to a considerable quantity of young individuals which are still alive.

Such facts as these certainly appear at first sight to allow us to

think that in the *Araneida* production by virgin females takes place, and that fecundation by the males is unnecessary, at least under all circumstances. But to get at the knowledge of the truth, it is often very useful not to rest satisfied with a single set of observations. The examination of the generative organs of the *Araneida* in fact gives the most complete explanation of these productions by females kept in captivity for several years.

Amongst the *Araneida* we must distinguish between those whose life only lasts one season, and those of which, on the contrary, the existence is prolonged far beyond this term. In the former a single oviposition takes place; in the others, the broods succeed each other from year to year without the concurrence of the males; only, as is shown by attentive observation and experiment, the concurrence of the male is necessary at least once.

Mygale, Clotho, Filistata, Segestria, &c., all belong to the category of species which usually live several years; in all, leaving out of consideration certain secondary modifications, the female apparatus is composed of two large tubes, sometimes united at the extremity, sometimes isolated and terminated by a cæcum, to which the ovarian chambers are appended. At the moment of copulation these tubes receive the seminal fluid in abundance; they are true spermatric reservoirs; the eggs, on the point of being expelled, are impregnated during their passage. The fecundating liquid not being exhausted by a single oviposition, and being preserved with all its qualities in its reservoirs, as I have repeatedly ascertained by microscopic examination, new ovipositions may take place at longer or shorter intervals, without any necessity for fresh copulations.

The study of the arrangement of the generative organs, and the ascertainment of the presence of spermatozoids in the large ovarian conduits, prove convincingly that the female *Araneida* are not fitted to furnish fertile products, except after copulation. But this kind of proof is not the only one to which I have turned my attention. Keeping in captivity spiders of different kinds, especially of the genera *Mygale* and *Filistata*, which had not acquired their full development, I have succeeded, in many cases, in feeding them up to the term of their growth; these individuals, taken young, had certainly never received the approaches of the male, and the eggs obtained from them always remained barren.—*Comptes Rendus*, 6 April 1857, p. 741.

On the Brain of the Dytici, in its relations to Locomotion.

By E. FAIVRE.

The following experiments have been made upon a great number of *Dytici*, both males and females, with the view of ascertaining the relations of the cerebral ganglia to the locomotion of the animals.

1. *Total or partial removal of the supra-oesophageal ganglion.*—If the whole of the supra-oesophageal ganglion be removed from a *Dyticus*, the animal remains motionless for some moments, without giving any signs of great pain. It soon begins to walk straight forward, but with much greater difficulty than in the normal state; it